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## PHOEBES IN CENTRAL NEBRASKA

BY H. ELLIOTT McCLURE

Two species of phoebes, the Eastern Phoebe (*Sayornis phoebe*) and Say's Phoebe (*Sayornis saya saya*), occur in central Nebraska. In eastern Nebraska the Say's is rare, while in western counties the eastern species is seldom found.

In the summer of 1941, phoebes were noticed nesting upon the upper surfaces of stringers beneath irrigation and road bridges. Nests were observed at 76 bridges within 20 miles of Ord in 1942 and at 95 in 1943. They were checked at weekly intervals, fledgling phoebes were banded, and a record was kept concerning the numbers of young raised and the use of bridges by the two species.

Central Nebraska is almost at the westernmost limit of the range of

the Eastern Phoebe. This species was not as abundant as the Say's whose nests were 4.6 times as numerous as those of the eastern bird. In the 1942 study, the nesting activity of each species was not separately recorded.

Over half of the bridges under observation supported new or old phoebe nests. On average, 40 per cent of the bridges were used for first broods and 29 per cent for second broods. This would indicate that 73 per cent of the phoebes nested a second time, if we assume that all that re-nested returned to their home bridges. By actual count, only about 51 per cent of the nests were used twice in a season, but many pairs probably sought other sites for their second attempts. If any young left a nest, the nest was considered successful for the season and for that particular brood. The study showed a two-year average success of 78.5 per cent for the first brood and 76 per cent for the second brood. A stream broke into an irrigation canal and flooded nests under observation in 1942 so that success of second broods was lower. For all nests under observation the average success was 77 per cent. Data in Table 1 concerning number of eggs laid and percentage of hatch are probably inaccurate, because nests were often found after the young had hatched. The average number of young fledged is only slightly greater for first broods than for second ones.

TABLE 1  
RECORDS CONCERNING THE NESTING OF PHOEBES BENEATH BRIDGES IN  
CENTRAL NEBRASKA, 1942-1943

	1942	1943
Number of bridges examined	76	95
Number of bridges with phoebe nests	43	51
Percentage of bridges having old or new nests	55.2	53.7
Percentage of bridges with active nests, first brood	35.5	44.2
Percentage of bridges with active nests, second brood	20.0	38.0
Number of nests	48	51
Percentage of success of nests	70.0	84.5
Number of first broods	27	43
Number of successful first broods	20	35
Percentage of success, first brood	74.0	83.0
Number of young raised in first brood	97	136
Average number of young in first brood	4.85	4.4
Number of second broods	15	36
Number of successful second broods	10	31
Percentage of success, second brood	66.0	86.0
Number of young raised, second broods	40	94
Average number of young in second brood	4.0	4.0
Percentage of nests used for both broods	55.0	47.0

TABLE 1—*Continued*

	1942	1943
Number of eggs laid	157	297
Number of eggs hatched	142	230
Percentage of hatch	90.0	77.4
Average number of phoebes raised per bridge	1.8	2.6
Estimated total from bridges in county	403	582

Both species nested about farm and town buildings as well as beneath bridges. It was thought that it might be possible to derive an index of the number of phoebes present through a systematic search of the bridges in any one vicinity. Using the average number of birds reared per bridge and the total bridges in a county it should be possible to indicate something of the population density. Valley County has some 224 irrigation and road bridges, and from the information procured from the bridges under observation it was estimated that over 400 phoebes were raised in 1942 and nearly 600 in 1943.

The Say's is larger than the Eastern Phoebe, has a yellowish-tan breast and a slightly different call, and the young have more yellow or brown in their feathers than do those of the Eastern Phoebe. There is very little that distinguishes the nests of the two and, similarly, the eggs are almost identical in size and coloring. Both species commonly lay four or five eggs at a setting, but a few of the Say's nests have been found which contained seven young. When fewer than three eggs were noted in a nest, it was believed to be the result of egg losses. The average number of young reared (Table 2) is slightly higher for the eastern species than for the western. Both species show a high percentage of success in rearing young for both first and second broods. Of the first brood, 91 per cent of the Say's and 90 per cent of the eastern young were successful in leaving the nest. Of the nests under observation 90 per cent of Say's and 100 per cent of Eastern's young of second broods left their nests. No attempt was made to determine survival after they left the nest.

W. P. Smith (Auk, 59: 410-417, 1942) noted that second broods were exceptional at Wells, Vermont, at a latitude of 44 degrees north and M. M. Nice (Bird-banding, 13: 187, 1942) found them the rule in central Massachusetts at 42° N. latitude. Ord is in the vicinity of 41.5° N. latitude. In 1943, first broods of Say's young were banded between May 23 and July 2. The bulk of first broods under observation were banded June 10 and June 25. Second broods reached banding age between July 10 and July 29. The bulk of these were banded July 21. The Eastern Phoebe had young of bandable age

between May 16 and June 16. The second brood of similar age extended between July 10 and 22. Smith indicated an incubation period of 14–16 days for the eastern species and a juvenile period of 15–17 days. In Vermont, the first brood left June 16 to July 2 and the second brood in the last of July. Both periods coincide closely with the data from Ord.

Even though the nests are usually above water when placed on projections beneath a bridge, the young do not leave until fully capable of flight, hence there is very little loss from drowning. Such locations offer excellent protection against snakes, predatory mammals and birds. This, no doubt, accounts for the high success of nesting activities.

TABLE 2

## COMPARISON OF NESTING OF SAY'S AND EASTERN PHOEBES IN NEBRASKA

	<i>Say's Eastern</i>	
Average number of young raised, first brood	4.3	4.5
Average number of young raised, second brood	4.0	4.1
Number of nests observed	42	9
Percentage of success, first brood	80	86
Percentage of success, second brood	86	86
Number of first broods observed	36	7
Number of second broods observed	29	7
First brood, percentage of eggs to hatch	85	100
First brood, percentage of nests successful	80	86
First brood, percentage of young to leave nest	91	90
Second brood, percentage of eggs to hatch	77	83
Second brood, percentage of nests successful	86	86
Second brood, percentage of young to leave nest	90	100

It is the common modern trend to streamline all man-made structures. In many instances there are great advantages in doing so. Modern bridge construction is tending more and more to smooth surfaces, leaving no projections and no exposed timbers. The bridges under observation were used not only by Phoebes, but by Mourning Doves (*Zenaidura macroura*), Robins (*Turdus migratorius*), Catbirds (*Dumetella carolinensis*), House Wrens (*Troglodytes aedon*), domestic pigeons (*Columba livia*) and English Sparrows (*Passer domesticus*). The use of creosoted or treated timbers in construction of the bridges did not in any way deter these birds from nest building. Other things being equal, it is more desirable to have road engineers build bridges which support this wildlife population than to build those which are of no use to the birds and mammals that might come in contact with them. It seems to me that, if in the future we are going to be able to maintain our native fauna even in small numbers, so

small a thing as the construction of road bridges should not be overlooked when by minor changes it is possible to allow for the increase or maintenance of several species of our beautiful and beneficial birds.

In central Nebraska the two species of phoebes, Say's and Eastern, are present in a ratio of 4.6 Say's to one Eastern. Both are commonly found nesting beneath bridges. They both average slightly more than four young per brood for two broods. Determining the average number of young raised per given number of bridges presents a usable method of estimating changes in phoebe populations in areas as large as or larger than counties.

Ord

Nebraska

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A SYSTEMATIC STUDY OF THE MAIN ARTERIES IN THE  
REGION OF THE HEART—AVES XVII  
COLYMBIFORMES, PART 1<sup>1</sup>

BY FRED H. GLENNY<sup>2</sup>

INTRODUCTION

GARROD (1873) reported that *Colymbus glacialis*, *Alca torda*, and *Uria troile* presented two carotid arteries (aves bicarotidinae normales), while *Podiceps cristatus*, *Podiceps minor*, and *Arctica alle* had but one carotid present—on the left side.

Although the present writer has not had an opportunity to check Garrod's findings in these respects, further studies on this group of birds have shown that still other species present the condition referred to by Garrod as "aves laevo-carotidinae."

MATERIALS

Only single specimens of *Podilymbus podiceps* (Linnaeus), *Colymbus grisegena holböllii* (Reinhardt), and *Colymbus auritus* Linnaeus were dissected and diagrams of the arterial arrangements prepared.

Materials for this study were made available by Dr. Alexander Wetmore and Dr. Herbert Friedmann, United States National Museum, and Mr. L. L. Snyder, Royal Ontario Museum of Zoology.

OBSERVATIONS

The basic family arrangement-pattern of arteries in the neck and thorax is characteristic for the species studied. The aortic root (1)

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